Our Fourfooted Friends

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Published Quarterly by the Animal Rescue League of Boston

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Editor: CARLTON E. BUTTRICK *Associate Editor:* MRS. ROCKWELL COFFIN

Volume 58 DECEMBER 1961 *Number 4*

Radiation Fallout

AND ITS EFFECT ON LIVESTOCK AND CROPS

By GUY W. MANN

Editor's note: Believing that animal protective societies should keep abreast of events, the League President delegated Mr. Mann, Livestock Conservation Director, to make a thorough study of the effects of radioactive fallout on livestock and crops. This Mr. Mann has done and has grown to be something of an expert. He has been invited to speak on the subject at several meetings, and the article which follows was a talk given by Mr. Mann before a bankers' conference in Laconia, New Hampshire. We think it is timely, and hope it will be of interest to our readers.]

THE greatest threat to rural America is radioactive fallout from a nuclear weapon. Fallout from one weapon alone can cover thousands of square miles far from the actual explosion. If rural people are prepared to protect themselves, their livestock and crops against fallout, its harmful effects can be neutralized.

It is of vital importance that all people in rural sections of the country understand now this hazard of nuclear attack and how to protect against it.

A nuclear explosion is accompanied by four destructive phenomena: 1. Blast. 2. Heat. 3. Initial radiation, and 4. Residual radiation. The first three are almost instantaneous at the moment of detonation. But the fourth (residual radiation) produces its effects later, longer, and over a wider area as fallout. At this time let us concern ourselves with "Fallout and its Effects on Crops and Livestock." Fallout is the term used to describe radioactive material produced by a nuclear explosion that falls to earth from the upper air. Radioactivity is nothing new. Livestock and crops are constantly exposed to small amounts of radiation. Cosmic rays from space continually pass through living cells. Radioactive materials occur naturally in the soil, water and the air. We ourselves are also exposed to radiation when we have x-ray examinations. The explosions of nuclear weapons produce larger amounts of radioactive elements than animals can tolerate. The soil crops, water, even buildings, yards and fields, can be so contaminated that they are unsafe to use for varying periods of time.

Nuclear explosions may occur under ground, underwater, in the air, or close to the surface. We agriculturalists at this time are most concerned with the surface explosion as it produces the most fallout. In this instance particles of earth debris in the amount of thousands of tons are combined with the radioactive portions of the bomb and taken into the familiar fire ball and rise in the mushroom clouds. The particles are converted into gases. As these condense and solidify during cooling they entrap radioisotopes formed from the bomb. Other particles do not fuse but collect radioisotopes on their surfaces.

About one-half of this material will return to the earth's surface as fallout near the blast in about 12 hours. The remainder may go into the atmosphere to the troposphere or even into the stratosphere and then gradually descend over a period of years anywhere in the world. The size of fallout particles together with the wind, rain and other atmospheric conditions will determine largely when and where they will fall to the earth's surface. Roughly speaking, fallout can start about one minute after the explosion and continue for years.

Gamma and Beta rays are the two most important types of radiation in fallout. Gamma rays are electromagnetic energy just as are light, radio waves and x-rays. They travel through long distances, (many feet through air and several feet through water.) Beta rays are particles

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similar to electrons and can be stopped by several thicknesses of clothing. They can cause severe burns on livestock where the skin is exposed, such as around the eyes, mouth, udder, vent and in the ears. They are a serious menace if fallout is eaten or inhaled by livestock. Some of the isotopes in fallout are concentrated in certain tissues of livestock where the Beta rays may produce intense local damage. Some of these elements continue to emit Beta rays for many years.

About 200 different isotopes of nearly 40 elements have been identified from a nuclear explosion. The radio activity of each isotope decays at a specific rate, different for each isotope. This is expressed as half-life. Some half-lives are a matter of seconds, others are years. The total radiation hazard of newly formed fallout decreases rapidly at first because it contains many radioisotopes with short half-lives.

Externally, animals are able to withstand continued exposure to small amounts of radiation from natural sources without any obviously harmful consequences. Most of the cells damaged by radiation recover or may be replaced by tissue regenerated from unaffected neighboring cells. But if the rate of delivery of the radiation is rapid and the total dose is large, recovery does not keep pace with the injury.

An acute exposure on livestock of 700 roentgens applied to a small region may result in considerable biological damage to the irradiated area, but the overall health of the individual may be apparently unaffected. If the entire body of the animal is exposed to 700 roentgens death will probably result.

Internal radiation is the serious and long lasting problem created by the consumption of contaminated food and water. It is caused chiefly by Beta radiation capable of traveling only short distances in the body.

EXPECTED EFFECTS OF ACUTE WHOLE-BODY RADIATION DOSES

Acute Dose (Roentgens)	*Effect*
0–25	No obvious injury
25–50	Possible blood changes but no serious injury
50–100	Blood-cell changes, some injury, no disability
100–200	Injury, possible disability
200–400	Injury and disability certain: death possible
450	Fatal to 50 percent
600 or more	Fatal

We measure radiation in terms of roentgens: this term compares with calorie for heat, or kilowatt hour for electricity. Total accumulated radiation is expressed as so many roentgens: the rate at which radiation is given off by fallout is expressed as roentgens per-unit of time, usually per hour.

Human senses do not detect fallout radiation. Rate meters are used to measure radiation rated in an area. We call them monitoring devices.

The Geiger counter is a highly sensitive instrument. It has a measurement range of from zero to 50 milliroentgens per hour. (0–50/1000 of a roentgen.) It is useless for measuring significant amounts of fallout. *A Gamma Survey meter C D-710*, measures from 0–50 roentgens per hour.

A *high range Beta-wamma survey meter C D-720*, measures from 0–500 roentgens per hour.

Dosimeters are used to measure accumulated dose (1.) *C.D.V. 730* measures 0–20 roentgens (2.) *C.D.V. 740* measures 0–100. They are also useful for monitoring personnel. Chemicals and photographic and electrostatic principles, are used in preparing these badges.

The three basic elements of protecting stock from fallout are: Distance, time, and shielding (shelter.) Distance, because the external radiation is reduced in intensity as it moves away from the point of origin. Time is a protection against external radiation because of the decay factor of radioactivity. Shelter is a most important factor in protecting stock from fallout. If enough shielding is provided between animals and the source of radiation the exposure can be reduced to a negligible point.

Livestock owners will generally find it impractical to remove animals from fallout areas. Therefore, facilities for the care of the animals in shelter and adequate supplies of uncontaminated feed and water for at least two weeks would be needed.

A tight barn would reduce radiation dosage about one half. The best shelter would be the typical old time New England barn, (two story with a basement, and a loft filled with hay.) The animals could be placed in the barn cellar and all openings closed, except for a baffle type opening for ventilation. We must keep in mind that any type of shelter will reduce radiation, even the lee of a hill or a tree will be beneficial.

The following chart shows the relative amount of roentgens as affecting man and animals.

DOSE (ROENTGENS) TO KILL 50%

Dog	325	Swine	450
Goat	350	Cow	750
Sheep	350	Rabbit	800
Man	450	Chicken	1000

It is also known that if the time is increased over which the dose is received, animals can take considerably more radiation than shown in the above table. Animals exposed to radiation could be salvaged for food if slaughtered prior to the period when sickness begins. Problems of finding a safe area to butcher, store, and distribute would need to be solved. It would be unwise to begin indiscriminate slaughtering of herds merely on the as-

sumption that the animals might die anyway and their meat lost to the surviving population. Animals to be killed for meat should be washed with water; a mild non-detergent could be used. The viscera and hide should be considered contaminated. Under certain conditions the bones should be considered contaminated, also.

Livestock should not be allowed to graze on contaminated pastures if another source of food is available. One or more drenching rains would wash much of the contamination from the foliage. Water from drilled wells and springs can be considered safe. These sources in any case would be preferred over lakes, ponds or streams. It would always be better to give animals contaminated water than to have them die or suffer from thirst.

The radiation from fallout particles has no harmful effects on non-living material or plants. Irradiated food can be eaten. Harvest crops, if under some kind of cover, would be safe to use; there is some danger however if the feed becomes contaminated with radioactive particles. For this reason, harvested crops should be under cover of a building or covered by a tarpaulin if left outside. The top few inches of silage in an open silo should not be fed. The surface layer of hay should be removed from a haystack and the rest would probably be safe to use.

If the crops are nearly ready to harvest, the main problem would be: (1) radiation hazard to the worker; and (2) the shortage of fuel and machinery. Deliberate exposure of people to very much radiation in order to save a crop would in general not be warranted, unless such food was absolutely essential to survival. Therefore, harvesting should be delayed a few weeks and radiological monitors should advise you of the situation on your particular farm. For crops that have quite a period of growing time left before maturity, you should use as much delay as possible in tending the crops to take full advantage of the effects of decay and natural weathering to reduce the radiation hazard. Some of the radioactive material will be taken up (absorbed) by the plant. The most hazardous are strontium, iodine, and cesium. Radioactive iodine is very similar to ordinary iodine. When it is consumed with contaminated plants it gets into the biological system. It collects in the thyroid gland. In mammals it can be transferred to milk. Its radiation hazard has virtually disappeared in about 60 days. While the early acute hazards may be serious, there is general agreement among research scientists that iodine will not be an important long-term fallout hazard.

Cesium has a half-life of 30 years and is somewhat similar to the essential nutrient element potassium. When it is consumed and absorbed it is found primarily in muscle tissue, but this radioisotope is not retained long in the body. It continually enters and leaves the system just as potassium.

Strontium 90, however, with a half-life of 28 years, is of primary importance. It behaves much like calcium in soils, plants, and animals. Nuclear explosions produce large amounts of strontium. It is taken up in biological systems, secreted in milk, and collects in bones, where it remains for a number of years. Such deposits of radioactive strontium *may* produce bone tumors, but they probably would not appear for many years, if at all. The more strontium deposited — the greater the likelihood of tumors.

Just as other radioactive isotopes of fallout, strontium falls on the surface of plants and can be consumed with contaminated foods and forage. Some of it enters the soil, remaining for considerable periods in the top several inches of uncultivated land. From here it is taken up by plants along with calcium, and when the plants are eaten by animals the radioactive strontium enters the bone and milk.

Fortunately, there is a protective factor termed the "discrimination factor." As the strontium and calcium move together through the food chain from the soil to the plant, through the body of animals to the meat and milk, and even through the body of man to its resting place in the bones, relatively more calcium than strontium is left. This is the natural discrimination between calcium and strontium. The findings show that if there are 100 units of strontium to each 100 units of calcium in plants, only 8 to 16 units of strontium for each 100 units of calcium would enter the bones of the human population. Because milk is the outstanding food for building healthy bones and teeth, it would not be wise to recommend the substitution of another source of calcium in our diets, except under conditions of extreme emergency. In fact, the evidence available at this time would indicate that it is better to continue getting more of our dietary calcium from milk and less from plants.

Much has been said about the long-range effects of radiation exposure, increased incidence of leukemia, shortening of the life span, genetic implications and the development of bone tumors. No doubt the radiation exposures received in a nuclear war would result in some increase in the small percentages of such occurrences normally expected. In a nuclear attack on this country, however, it is the acute effects, radiation sickness and early death, that must be dealt with first. The fact that the chances of developing leukemia or bone tumors are somewhat increased should not be discounted, but certainly these factors should be considered as secondary in importance to the primary objective of immediate survival.

Fallout on soil appears to remain in the top few inches of soil for a considerable period of time, particularly the long lived isotopes. Leaching of soils to move strontium below the root zone would have only limited effectiveness.

Several agencies are conducting investigations on methods of reclaiming contaminated soil for use in the production of food in the event of catastrophic fallout. Among the methods that have been examined or are being studied are: (1) deep plowing; (2) diversion to other uses, (3) surface soil removal; and (4) protective mulches.

Deep plowing would be aimed at turning the contaminated surface soil under to a level of one foot or more — or below the root zone of the plants that are to be grown. Deep plowing may reduce the uptake of strontium 90 in shallow-rooted crops such as grasses and many vegetables. However, before it is used, careful evaluation should be made of the situation in the area and the possible alternatives. Once strontium 90 has been plowed under, it is in the soil virtually permanently and no method of future removal is known at this time.

Diversion of the soil to other uses may mean changing the species of crop grown on the land. The quantity of strontium 90 absorbed could be reduced by growing crops with low concentrations of strontium and calcium in their edible tissues. However, since plants are a source of calcium, this measure would result in the calcium content of diets being reduced. Unless alternative sources of dietary calcium were provided, cultivating low calcium crops would have obvious limitations. However, in wartime emergencies survival might be aided by this procedure. Potatoes which contain about 10 milligrams of calcium per 100 calories, are a particularly suitable crop in contrast to leafy vegetables, which may contain 10 to 100 times that amount of calcium per 100 calories.

If the top several inches of the soil are contaminated with strontium 90, deep rooted plants may be grown with little uptake of the radioactive material because they draw their nutrients from below the contaminated level. For example, contaminated land could be taken out of shallow rooted forages or crops and be used for producing such deep rooted crops as alfalfa. Another diversion might be to take land out of direct food production and use it for cotton fiber, flax, castorbeans, timber, or other non-food production. If the land is too heavily contaminated, it might have to be taken out of agricultural production for an indefinite period.

Removing the contaminated surface soil by scraping has been from partially to highly successful, depending on the roughness of the land. By carefully removing the contaminated surface and burying the radioactive soil in an isolated area, the land may be reclaimed for some use. The method is expensive and with procedures developed at this time — not suitable for large acreage. It might be useful if small, clean areas are seriously needed to produce food for survival.

By liming acid soil, more calcium is made available to the plant and less strontium 90 will be absorbed. The practice would be useful on highly acid soils on which liming would be normally beneficial for other reasons. On low acidic soils that are high in exchangeable calcium, addition of lime would have little effect.

The approach to reclaiming contaminated soil in any given area would depend on the degree of radioactivity and the needs for survival. Further tests are being conducted under a variety of land conditions and various systems of land management.

Other studies of the response of animals to daily intakes of radioisotopes with particular reference to their movement in the food chain and the resulting pathology are being conducted. Present work is designed to determine the extent to which radiostrontium ingested by the dairy animal becomes incorporated and is excreted into the milk. The study also includes possible means of altering this movement and disposition of the radioisotope. At present it appears that milk would be the best source of calcium even though it is contaminated.

EDITOR'S NOTE: Mrs. Rockwell Coffin's usual Cape Cod Branch page will not appear in this issue, but with the following poem by Mrs. Coffin and another on page 14 she extends holiday greetings to her many friends.

MESSAGE FROM BLACKIE

by

Margaret Morse Coffin

He went away, My Master,
Into an unknown land.
Though why he had to leave me,
I do not understand.

He left his old green afghan,
I clawed with such delight.
I whisper when I'm passing,
Will you come home tonight?

I hear light laughter ringing,
As in bright days of old.
He didn't mind my clinging,
He never thought to scold.

I've heard that cats are "Psychic"
Whatever that may mean,
I know that he's the kindest man —
Whom I have ever seen.

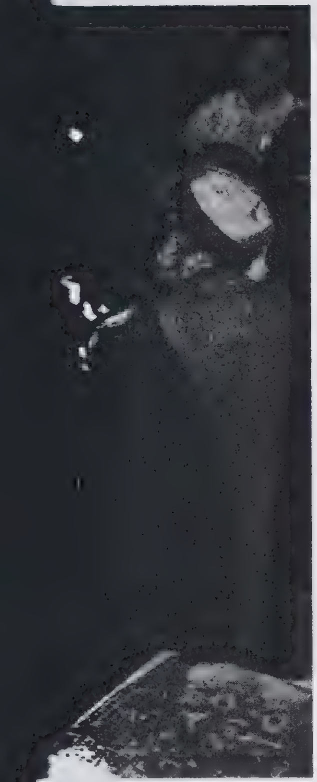
I traveled many a weary mile,
Before I found this home,
So I'll wait here, My Master dear —
God willing ne'er to roam.

Shoppers were attracted to the gaily decorated Animal Helpers' Table in charge of Mrs. Robert L. Spooner.

LET'S GO TO THE FAIR

Pictured on these pages are scenes taken at the League's 59th Annual Fair. We are greatly indebted to the ladies of the Fair Committee and their many helpers who aided in making this a successful event. We also are grateful to those individuals and business organizations who contributed money or articles in response to our appeal and our many friends who attended this annual festival.

Presiding over the goodies at the Snack Bar were Mesdames Sydney Rosenthal, Ralph W. Orrill, William S. Friend, and Edward M. Larsen.



— conducts a
headquarters.

League President, Carlton E. Buttrick, hands Mrs. Buttrick additional delicacies for the Pine Ridge Table. Assisting Mrs. Buttrick are Miss Harriet G. Bird and Mesdames Deuel Richardson, Dana Burdette and Henry Gascoigne.

Mrs. Albert W. Gaines and Mrs. Ralph Barnes — assisted by "Peter Pan" — had many home cooked pastries for sale at the Food Table.

Mrs. Brooks Potter {center}, Co-chairman of this year's Fair, has an interested patron at the Toy Table.

The Humane Approach to the Use of Animals IN HIGH SCHOOL SCIENCE PROJECTS

By CARLTON E. BUTTRICK

The following is a speech presented at a symposium on the use of animals in biological research for high school science teachers and their students at the 12th Annual Meeting of the Animal Care Panel held recently in Boston.

ANIMAL experimentation in secondary schools has received a great deal of publicity since the advent of the space age.

What are the reasons for these experiments? Do the students know what they are looking for? Is the high school biology teacher qualified to supervise such experiments?

Looking at a starfish floating in formaldehyde was, in many high schools, standard procedure for biology classes not ten years ago. In other schools, activity was limited to the examination and occasional dissection of preserved animals such as fetal piglets, worms and insects.

But this has given way to the idea of group testing and dissection of a living mouse to see why cancer occurs or how a rabbit reacts when it is pregnant. These classes are supposedly conducted to show the student "what makes life tick."

Curiosity cannot be the only reason for this surge of experimentation. Students have been curious for generations, but the widespread publicity today surrounding high school laboratory experiments was not present before.

Perhaps one of the foremost reasons for the increasing number of out-of-the-ordinary experiments is the emphasis put on "science." Not only is the young student attracted by the promise of fame and publicity, but scholarships are many times offered to the "outstanding" entries in national science fairs. With so much emphasis on the need for scientists, the American youth finds a pressure that heretofore did not exist in the schoolroom.

What types of research are some of our young people doing? Well, here are a few examples of actual cases reported: (a) Inducing diabetes in mice by removing the pancreas, (b) Transplantation of ovarian tissues on female mice, (c) Injection of frozen spider venom in mice for the purpose of observing symptoms of black widow poisoning as the mice died, (d) Dissecting mice to investigate their immunity to tumor transplants.

Recently a high school girl visited the Animal Rescue League of Boston clinic and presented two white mice for examination. One was dead — and had been for several days — and the second proved to be sick and was put to sleep. The League veterinarian made a particular point of questioning this girl and learned that originally she had owned two mice, but had bought four more from a pet shop in order to perform a nutrition experiment for a science fair at the school which she attended. All had died except the mouse presented for examination. The girl seemed to have no idea of what she was doing or what she was trying to accomplish. Her main concern seemed to be to secure a statement that it was impossible for her to complete her experiment.

A telephone inquiry to the League's clinic receptionist by the mother of a high school student revealed another case. This time it was a request to run blood counts on several groups of white mice. In one group the student had been trying to develop leukemia by feeding a high concentration of vinegar, while two control groups had been fed a regular diet of mice pellets.

There is no justification for such needless suffering being inflicted in the name of science. No new knowledge or anything of a practical or theoretical importance is gained. Such research is uselessly inhumane. Of far greater value to the student at this stage of his career would be an understanding of man's dependence on animals and the role they play in everyday life.

We, in the animal protective field, are not alone in being aware of the problems and inhumaneness that can arise from improperly supervised experiments at the elementary and secondary levels.

Angelo Patri, noted writer and educator, states: "I was distressed to learn that children in secondary schools are being allowed to experiment with live creatures. I am sorry that this should be practiced in any school below college level. The secondary pupil is emotionally immature and his character still unstable, and he should not be exposed to such experiences."

Mrs. Eleanor Roosevelt, who certainly has been a staunch supporter of medical science, recently wrote in a letter to the President of the National P. T. A. Congress. "It seems to me of great importance to teach our children respect for life. Towards this end experiments on living animals in classrooms should be stopped. To encourage cruelty — in the name of science — can only destroy the finer emotions of affection and sympathy and breed an unfeeling callousness in the young towards suffering in all living creatures."

At the National Conference on the Legal Environment of Medical Science, held in May 1959, the teaching of science in secondary schools was a topic of vital importance.

It was stated at the meeting that although "it is imperative that live animals be permitted for teaching purposes . . ." there is also "need, incentive and pressure to improve teaching of biological sciences in secondary schools."

Emphasized was the fact that "the high school biology teacher should have the best facilities for handling live animals . . . and should be oriented to their proper use."

It was specifically recommended that "dogs, cats and primates not be used in student experiments and that students must not keep animals on experiment in their homes."

A first-rate statement on animals in class-rooms, concise, humane and to the point, has been published by the Florida State Department of Education. Every State in the Union would do well to give the same sound guidance to its teachers. Following is the section on this subject from "A Guide to Science in Florida Secondary Schools":

"THE USE OF LIVE ANIMALS AS TEACHING AIDS — In many cases, animals should be kept in biology classrooms so that students can be given opportunities to be trained in careful observation of animal behavior. This is important if students are to learn effectively the many facts about animal behavior, heredity, learning ability, natural habitats, sociological factors, adequate care as related to eating, sleeping, exercising, compatibility with other animals or those of like kind but of the same or different sex.

"A science teacher who proposes to use live animals in teaching procedures must be aware, first of all, that issues of morality may be and often are involved. It is important that the health and well-being of animals not be interfered with when they are being used in the classroom.

"The teacher must also realize that any classroom use of animals, even those that by most persons would be regarded as benign, may evoke disturbing emotional reactions in some students. Demonstrations or experiments in which animals are unnecessarily killed or are subjected to any procedure that offends a student's moral and ethical standards may, in the opinion of many psychologists and psychiatrists, be harmfully traumatic to the student. A student may 'learn' many things from classroom use of animals, and physiology may be the least of them.

"When animals are used as teaching aids in the classroom, it is suggested that these recommendations be followed:

1. Do not kill animals in the presence of students.
2. Animals shall be kept in the classrooms for the minimum time necessary for the teaching purpose. If kept over week ends or during holidays, a responsible person shall provide daily food and water and shall clean the cages.
3. All animals must at all times have a plentiful supply of fresh, clean water and healthful food, appropriate to the species.
4. Cages and enclosures for animals shall be appropriate to the species and the number of animals, allowing room for healthful exercise and comfortable existence, with provision for humane environmental conditions — temperature, humidity, and the like.
5. It should be emphasized to students that cruelty to animals is unethical and in Florida is illegal.
6. The teacher using animals in a classroom is personally responsible for maintaining these standards and for carefully considering the ethical and moral issues involved."

In conclusion, I must concur with The American Humane Association which is strongly opposed to the use of living animals in primary or secondary schools where the animals are subjected to physical suffering or discomfort as a part of the research, testing or teaching project.

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Notes and Advice from the Clinic

by the VETERINARY STAFF

A dog is very much like a human being in many respects. Although proper food, shelter, exercise, and sanitation are all very essential to maintaining good health and even temperament of a dog, attention, companionship, and affection also play a very integral part in his well being. Except for some of the toy breeds, which require extra care, dogs are generally quite hardy individuals, able to adapt themselves to almost any climate or living conditions. Pampering even to the degree of ascribing human attributes to a dog are not only unnecessary but should for the dog's own well being be absolutely avoided. However, he is entitled to the attention and affection of his master. Complete understanding between master and dog exists only when mutual confidence, trust, and affection are present.

A dog owner should spend at least some time with his dog in addition to looking after his necessities as food, water, shelter and sanitation. Naturally, if the dog is kept in the house, he sees much of the family and becomes part of it. However, if he is kept in an outside house or kennel, he should be removed from his confines at least once daily, and given a period of exercise on a leash or possibly allowed to run in an open space where he can do no mischief. Such a period can be employed to good advantage in training the dog in good behaviour. Also, it allows time for grooming which is essential to maintaining a healthy coat and skin. These attention-training periods will be eagerly looked forward to by the dog.

Fresh water should be available to the dog at all times, no matter where he is housed. He should be kept free of internal and external parasites and prompt attention should be paid to any apparent physical ill or impairment.

Bathing when necessary is an aid to good health of the skin and coat, but it can be overdone to their detriment. Dogs should be bathed only when soiled or suffering from external parasites. Much more benefit is derived from daily brushing or combing of the dog's coat than by infrequent baths. If it is necessary to bathe your dog in cold weather, he should be thoroughly dried with towels or clean cloths with attention to ears and feet and kept indoors in a warm room for several hours after the bath. Any mild soap or commercial hair shampoo is satisfactory, but care should be taken to avoid soapy water getting into the eyes and ear canals. Also, the coat should be well rinsed with clear water to ascertain that all the soap has been removed.

The eyes should be observed carefully after a romp in high grass or brush to make certain that no weed seeds or foreign material have lodged therein. If excessive tearing or obvious pawing at the eyes is observed, prompt attention by a veterinarian should be sought as such foreign material is very irritating and can cause serious damage to the eye.

The dog's ears are quite sensitive and care should be taken not to irritate them. Never wash a dog's ears with soap and water or alcohol. If it is necessary to clean the inside of a dog's ears, as it is sometimes in the long-eared breeds, it is well to simply employ a pledget of cotton with some peroxide or olive oil wiping only the ear flap and avoiding penetration deeper into the ear canal. Never employ cotton tufted applicators.

Feet should be checked after a run and prompt veterinary attention given to any cut on the pads or obvious lameness. Nails should be kept trimmed on a level with the base of the pads to avoid painful broken nails or equally painful ingrown dew claws. If the dog does not get much exercise on pavement or hard surfaces, the nails should be checked at least every month to six weeks and trimmed back normally. Gum or tar may be removed from the feet with nail polish remover or pine oil solution.

In general, dogs that are allowed to gnaw on bones of the large beef, non-splintering variety, will generally keep their teeth clean and free from tartar accumulations. However, it is well to have your veterinarian check the teeth closely periodically and clean them if necessary.

Form of Bequest

To the ANIMAL RESCUE LEAGUE OF BOSTON:

I give, devise, and bequeath the sum of .... dollars, and the real estate situated at No.......... Street, in the city (or town) of ......

Recently completed kennels at the U.S. Pacific Air Force's Sentry Dog Center in Japan.

HOW THE AIR FORCE CARES FOR ITS DOGS

CONSTANT sentry duty is required to assure the safety of our defense and weapons systems, and dogs are playing a part in protecting such installations, especially for lonely, nocturnal vigils. Recently, in fact, the United States Air Force and Army have stepped up the enlistment goal of "canine corps."

In an article published in the J.A.V.M.A., Robert W. Bailey, D.V.M., formerly veterinary officer at Lackland's USAF Sentry Dog Training Center, Texas, explains why.

Sentry-dog teams, consisting of specially trained dogs and their handlers are used in these important places because of their proven ability to detect and apprehend intruders, to deter aimless trespassing in security areas and, given the proper conditions, to replace up to five men.

The typical graduate of the eight-week training course with his handler, is a male German Shepherd Dog, weighing about 70 pounds, 24″ at the shoulder, and about 20 months old. This breed has been selected because of suitable constitution, adaptability to environment, and temperament. The dog must be well-mannered, but suspicious of all others except his handler, to whom he must be "fiercely loyal." His natural instincts for protectiveness and aggression are encouraged in training.

There are records of sentry dogs alerting their handlers to intruders up to 500 yards, and repeatedly demonstrating ability to detect trained "penetrators" during practice alerts in areas secured by sentry-dog teams.

Sentry dogs were used in Europe and the Far East beginning in 1952, with the U. S. forces using local dogs and trainers. Fort Carson, Colo. was the U. S. base of operations from 1954–1957. Within two years after establishment of the Lackland Center, more than 600 teams had been graduated and sent to guard Air Force or Army installations. At the Center about 160 dogs are usually kenneled at a given time, 120 in training, as 30 dogs and handlers enter the training course every two weeks. New recruits and the rejects awaiting return to their owners make up the balance of the population.

This large colony of dogs in a fairly well-controlled environment has provided an unparalleled opportunity for making certain observations on kennel construction and management. So much so that Dr. Bailey has helped in preparation of an Air Force Manual which includes construction and management of kennels for sentry-dog centers. The first premise of the design is for the health and comfort of the dog. Management and safety factors as well as building costs are also carefully considered.

The recommended kennel size is approximately 30 cubic feet, suggested dimensions being 30″ wide, 36″ high and approximately 45″ long, adequate to comfortably fit the average German Shepherd Dog. In cold climates, a heavy split canvas door is added to provide protection from the elements and also to conserve the dog's own body heat.

The elevation of the kennel — at least 12″ to 18″ from the ground — not only gratifies the dog's desire to loaf on an elevated platform but also provides shade, which is especially important in hot climates. Elevation aids, too,

in control of rodents and vermin since it eliminates harborage.

The minimum run space requirement for active dogs has been established as five square feet for each inch of the animal's height at the withers. Since the average German Shepherd is approximately 24″, this means that about 120 square feet should be provided. An ideal size run for a sentry dog is 7½ ft. wide and 15 ft. long, with the kennel located in the center. For an open run where the dog is chained, a six-foot chain attached to a single post will provide about the required minimum space.

Kennels and runs should be sited so that there is adequate drainage and no possibility of standing water after rain. To this end, individual runs at Lackland were separated by a checkerboard leaching ditch, 18″ wide and 24″ deep, filled with 2″ gravel rock with a 4–6″ surface of ¼″ crushed rock. This proved an effective method of providing drainage, since the ditch would not permit water to flow from one kennel to another.

The first permanent kennels at Lackland were unsatisfactory, although subsequently improved by adding benches and enclosed boxes for sleeping. The runs proved too narrow, causing traumatization of the ends of tails of dogs which constantly wagged them. Keeping the kennels scrubbed also kept them damp much of the time in the combined high temperature and humidity. Dr. Bailey also makes the interesting observation that dogs which became "stir-crazy" in the permanent-type kennel would quiet down and become tractable in the open environment of the single "bird-house" kennel. Moreover, coccidiosis and giardiosis were successfully controlled by combining treatment with simply moving these dogs to the gravel-covered runs of the single-kennel area. This stopped the autocontamination which perpetualized such infections in the concrete runs.

The circular runs of the individual kennels are covered with 4 to 6″ of pea gravel, and regular cleaning, along with exposure to the elements, adequately controls helminth and protozoan parasites. Another means of control is thorough soaking of the runs with a saturated solution of sodium chloride before a new occupant moves in.

After a series of comparison tests, it was shown that self-feeding was the most satisfactory method of maintaining the dogs kenneled under these special conditions. Continuous access to high quality dry dog food appears to supply nutritional and caloric requirements of working dogs better than feeding kitchen-mixed foods, with far less waste. The dogs were observed to establish their own requirements, averaging 1½ pounds during hot weather, nearly 2 pounds in the winter. In addition to the saving of material and manpower, criteria of weight gains, work performance, coat gloss, hematocrit values and relative incidence of enteric upsets, showed the "ad-lib" or self-feeding method to be "vastly superior."

In conclusion, Dr. Bailey emphasizes the importance of this program and of presenting carefully selected and examined candidates to the program, to reduce its costs, maintain its efficiency, and enhance its effectiveness.

TO GWEN—A WELSH CORGI

IN THE DAYS OF HER YOUTH

by

Margaret Morse Coffin

Gwenda of the golden coat,
Gwenda of the hazel eyes
Ancestors afar, remote
Made you steadfast — made you wise.

Where Carmarthen Bay glints rose
Slumb'rous in the twilit sheen
Where Taf's winding river flows
And lush valleys roll between —

There your sires a sturdy breed
Drove their masters' cattle home
Obedience their solemn creed
Lest one be lost or left to roam.

Gwen 'round our feet your swift steps weave
Your eyes upturned, we must be told
You will be herding, and believe
Will drive each straggler to our fold

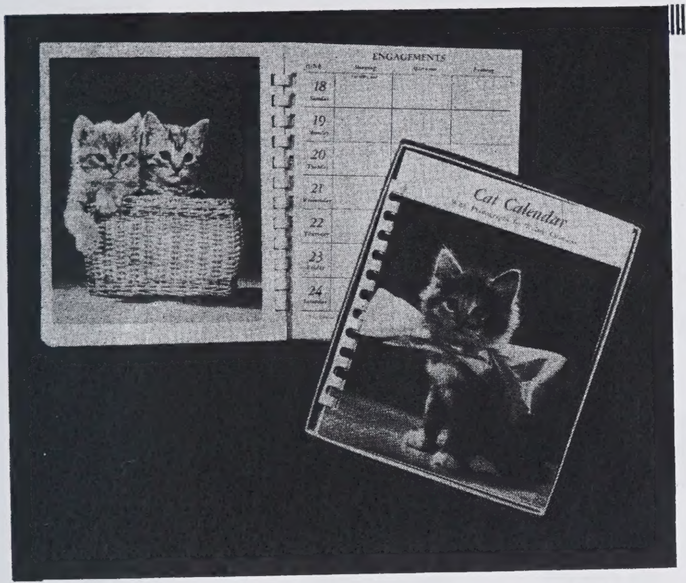
Alas! We have no colt nor kine
No heritage can we restore
But you, our guardian in fine
Are trusty keeper at our door.

Gwenda of the loving heart
In dreams your twinkling feet have trod
Some starry way in worlds apart
Where you kept vigil close to God.

PET ANIMAL CALENDARS

The League has available a supply of Pet Animal Calendars for 1962. There are six color photos of children and animals with two calendar months on each page of these 5″ x 6″ calendars. Many of our friends have used them for Christmas cards, and they make attractive reminders of your thoughtfulness throughout the new year. They come complete with an envelope suitable for mailing. The price is 15 cents each.

Please specify Pet Animal Calendars when ordering. Make your check or money order payable to the Animal Rescue League of Boston, and address your order to P. O. Box 265, Boston 17, Massachusetts.



1962

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